

exclude sequences with a random arrangement or monomer so the limitation in the claim reads on the block copolymer of Knoll.

However, vinyl aromatic hydrocarbon block as used in the claims should be interpreted in light of the specification. The term "vinyl aromatic hydrocarbon block" is defined in the specification at page 9, lines 1-3 where it is defined as one having an average polymerization degree of about 30 or more. This is also set forth in claim 1. Thus, regardless of the understanding in the art of the term "block" as alleged by the Examiner, blocks having an average polymerization degree of less than about 30 do not correspond to the "vinyl aromatic hydrocarbon polymer blocks" of the present invention.

Comparison of Present Invention and Knoll

Whether or not the random portions in the copolymer of Knoll have an average polymerization degree of 30 or higher is considered below.

First, while the Examiner alleges that Knoll discloses a process similar to that of applicants and therefore presumably produces products similar to the applicants (page 2, lines 6-10 of the Office Action), this is not the case. Comparisons in terms of polymerization conditions between Example 1 of the present application and the "Butadiene 1/Styrene 2" random portion in Example 1 of Knoll are summarized below.

| | Example 1 of Present Application | Butadiene 1/Styrene 2 Random Portion of Knoll et al. |
|--|----------------------------------|--|
| Amount of Catalyst (parts by weight) | 0.049 | 0.39 |
| Amount of Randomizing Agent (parts by weight) | 0.03 | 0.61 |
| Styrene Content in Random Portion (wt%) | 90 | 56 |
| Random Portion Polymerization Temperature (°C) | 75 | 73 (max) |
| Random Portion Polymerization Time (min) | 15 | 19 |

Notes: Calculations were made as shown below:

"Amount of Catalyst"

Present Application: As disclosed

Knoll et al: Since S-BuLi has a specific gravity of 0.894 g/ml, calculation was made as follows:

$$(42 \times 0.894) / (9612 / 100) = 0.39$$

"Amount of Randomizing Agent"

Present Application: As disclosed

Knoll et al: Since THF has a specific gravity of 0.89 g/ml, calculation was made as follows:

$$(65.8 \times 0.89) / (9612 / 100) = 0.61$$

"Styrene Content in Random Portion"

$$\text{Present Application: } 13.2 / (13.2 + 1.5) \times 100 = 90 (\%)$$

$$\text{Knoll et al: } 1412 / (1412 + 1120) \times 100 = 56 (\%)$$

The factors that can attribute to the random nature generated upon simultaneous and continuous supply of butadiene/styrene mixed solutions include the styrene content in the butadiene/styrene mixed solution (less styrene content gives higher random

nature), the amount of the randomizing agent (higher amount gives higher random nature), the amount of the catalyst (higher amount gives higher random nature), the polymerization temperature (higher temperature gives higher random nature), the polymerization time (longer time gives higher random nature), etc. As shown in the above Table, the random portion in Example 1 of Knoll was produced under conditions which give higher random nature in each and every item of the "Amount of Catalyst," "Amount of randomizing Agent," "Styrene Content in Random Portion" and "Random Portion Polymerization Time," as compared to the conditions used in Example 1 of the present application. Further, the butadiene-rich butadiene/styrene copolymer portion has a Tg remarkably as high as -10 to -13°C (cf: Tg of polybutadiene is about -90°C), indicating that the butadiene/styrene copolymer portion has a random structure.

Particularly, the randomizing agent added in Knoll is 20 times that added in the present application. It is evident that it is difficult to attain styrene polymerization degree of 30 or higher under such circumstances unless a special monomer-feeding manner such as a styrene continuous feeding followed by butadiene feeding (or vice versa) was employed. Furthermore, as for the monomer-feeding manner for the styrene/butadiene random portion, Knoll discloses in column 6, lines 21-26 that diene and vinylaromatic should be added as far as possible simultaneously. Thus, it cannot be expected that a block having a styrene polymerization degree of 30 or higher was obtained therein.

It is acknowledged that the butadiene/styrene polymer portions in the copolymer of Example 1 of Knoll each have a molecular weight of 35,000 or less. However, they do not have a styrene polymerization degree of 30 or more and thus they are not "vinyl aromatic hydrocarbon polymer blocks" as defined in applicants' invention. The

molecular weights of the Styrene 1 block and the Styrene 5 block can be calculated as $M_w = 18,000$ (see the reply filed April 6, 2006). Accordingly, in the copolymer disclosed in Knoll 100% of the vinyl aromatic hydrocarbon polymer blocks have a molecular weight of 35,000 or less. This does not fall within the scope of the claims.

Thus, the claims cannot be considered to be anticipated by Knoll and its withdrawal as a ground of rejection under §102(b) is therefore requested.

A heat shrinkable film produced using the block copolymer of Knoll will have too great a shrinkability at 80°C and poor resistance to fusion bonding in hot water. Therefore, it cannot achieve the physical property balance as required in the present invention.

Accordingly, the claims cannot be considered to be obvious over Knoll and its withdrawal as a ground of rejection under §103(a) is therefore also requested.

It is believed claims 1-25 are in condition for allowance.

In view of the foregoing remarks, Applicants submit that this claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Reply, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: December 28, 2006

By: 

Arthur S. Garrett

Reg. No. 20,338

Tel: 202 408 4091

1232093_1.DOC